

# Syllabus for Paul Dawkins Math 3301

This is the order of topics that I hope to follow this semester.

<b>Topic</b>	<b>Section in Book</b>
<b>Basic Concepts</b>	
Definitions	Sec 1.1 & Sec 1.3
Direction Fields	Sec 1.1
<b>First Order Differential Equations</b>	
Linear Differential Equations	Sec 2.1
Separable Differential Equations	Sec 2.2
Exact Differential Equations**	Sec 2.6
Bernoulli Equations**	N/A
Substitutions**	N/A
Intervals of Validity	Sec 2.4
Modeling With 1 <sup>st</sup> Order Differential Equations	Sec 2.3
Equilibrium Solutions	Sec 2.5
Euler's Method	Sec 8.1
<b>Exam 1 – Tentative Date : February 14, 2018</b>	
<b>Second Order Differential Equations</b>	
Basic Concepts	Sec 3.1
Real, Distinct Roots	Sec 3.1
Complex Roots	Sec 3.4
Repeated Roots	Sec 3.5
Reduction of Order	Sec 3.5
Fundamental Sets of Solutions	Sec 3.2
More on the Wronskian	Sec 3.3
Nonhomogeneous Differential Equations	Sec 3.6
Undetermined Coefficients	Sec 3.6
Variation of Parameters	Sec 3.7
Mechanical Vibrations	Sec 3.8 & Sec 3.9
<b>Exam 2 – Tentative Date : March 9, 2018 – Note that this is the Friday before Spring Break! Do NOT schedule an early spring break!</b>	

### **Laplace Transforms**

The Definition	Sec 6.1
Laplace Transforms	N/A
Inverse Laplace Transforms	6.2 & N/A
Step Functions	Sec 6.3
Solving IVP's with Laplace Transforms	Sec 6.2
Nonconstant Coefficient IVP's*	N/A
IVP's with Step Functions	Sec 6.4
Dirac Delta Function	Sec 6.5
Convolution Integral	Sec 6.6

**Exam 3 – Tentative Date : April 4, 2018**

### **Systems of Differential Equations**

Review : Systems of Equations	Sec 7.3
Review : Matrices and Vectors	Sec 7.2
Review : Eigenvalues and Eigenvectors	Sec 7.3
Systems of Differential Equations	Sec 7.1
Solutions to Systems	Sec 7.4
Phase Planes	Sec 9.1
Real, Distinct Eigenvalues	Sec 7.5
Complex Eigenvalues	Sec 7.6
Repeated Eigenvalues	Sec 7.7
Nonhomogeneous Systems **	Sec 7.9
Laplace Transforms**	N/A
Modeling	N/A

**Exam 4 – Tentative Date : April 27, 2018**

### **Series Solutions, Higher Order, Boundary Value Problems, Partial Differential Equations**

These chapters are not covered in this course. They do present some interesting material however and I'd invite you to check them out.

\* These sections are not on the syllabus and I cover them if I have the time.

\*\* These sections are not on the syllabus and while I'd like to cover them never have the time.